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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/324,304	06/02/1999	ZHENYU WANG	CASE2	1360

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EXAMINER	
BAYARD, EMMANUEL	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 05/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/324,304	WANG, ZHENYU	
	Examiner	Art Unit	
	Emmanuel Bayard	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47 and 49-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *40,41,43 and 44* is/are allowed.

6)☒ Claim(s) *1-5, 9-12, 20-24, 28, 30-33, 37-39, 42, 45-47 and 49-52* is/are rejected.

7)☒ Claim(s) *6-8,13-19,25-27,29 and 34-36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This is in response to amendment filed on 12/9/04 in which claim 48 is canceled and claims 1-47 and 49-52 are pending. The applicant's amendments have been fully considered but they are moot based on the ground of rejection.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 20-24, 37, 42, 47 and 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Morgan et al U.S. Patent No 5,476,488.

As per claim 1, Morgan et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20) representing a range for each of a plurality of possible message levels, wherein the sizes of the ranges are different for at least two of the message levels; and a comparator that identifies the message by comparing the received signal with the generated minimum and maximum thresholds (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60).

As per claim 2, Morgan et al inherently includes wherein the minimum and maximum thresholds are a function of an interrelationship between noise and the message level.

As per claim 3, Morgan et al inherently includes wherein the minimum and maximum thresholds are a function of the interrelationship between digital impairment and the message level.

As per claim 4, Morgan et al inherently includes wherein the minimum and maximum thresholds are a function of the interrelationship between coherent noise and the message level.

As per claim 20, Morgan et al teaches a receiver for identifying a transmitted message based upon a received signal, the receiver comprising: a processor for generating a constellation design having a minimum threshold and a maximum threshold for each of a plurality of possible signal levels (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20), the minimum and maximum thresholds for each possible signal level representing a range, wherein the sizes of the ranges are different for at least two of the possible signal levels; and a comparator (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60) that identifies the transmitted message by comparing the received signal with the generated constellation design and that generates an output signal representative of the transmitted message.

As per claim 21, Morgan et al teaches method of identifying a message based upon a received signal, the method comprising: receiving the signal (see col.2, line 30), providing a minimum threshold and a maximum threshold representing a range for each of a plurality of possible message levels (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20), wherein the sizes of the ranges are different for at least

two of the message levels, and identifying the message by comparing (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60) the received signal with the generated minimum and maximum thresholds.

As per claim 22, Morgan et al inherently includes wherein the minimum and maximum thresholds are generated as a function of an interrelationship between noise and the message level.

As per claim 23, Morgan et al inherently includes wherein the minimum and maximum thresholds are generated as a function of the interrelationship between digital impairment and the message level.

As per claim 24, Morgan et al inherently includes wherein the minimum and maximum thresholds are generated as a function of the interrelationship between coherent noise and the message level.

As per claims 37, 42, 47 Morgan et al teaches a receiver for identifying a message based upon a received signal, the receiver comprising: a processor that generates a minimum threshold and a maximum threshold representing a variable range for each of a plurality of possible message levels in a single constellation design (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20); a comparator (see figs. 1, 6 element 136 and col.5, lines 62-67 and col.6, lines 2-35 and col.8, lines 28-60) that identifies the message by comparing the received signal with the generated minimum and maximum thresholds, wherein the minimum and maximum thresholds are a function of an inter-relationship between noise and the message level.

As per claim 49, Morgan et al inherently includes wherein the distances d (i) are different for at least two different pairs of message levels.

As per claim 50, Morgan et al inherently includes further comprising the step of generating the minimum and maximum thresholds using transmitted training signals.

As per claim 51, Morgan et al inherently includes wherein the step of adjusting comprises removing from the constellation design a message level that gives rise to d (i) x dmin.

As per claim 52, Morgan et al inherently includes wherein the sizes of the ranges are different for at least two of the message levels.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 9-10, 28, 30-31, 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al U.S. patent No 5,476,488 in view of Bakke et al U.S. Patent No 5,621,766.

As per claims 9 and 28, Morgan et al teaches all the features of the claimed invention except i means for determining a distance d (I) between received signal levels, the distance d (I) having different values for a plurality of message levels.

Bakke et al teaches means for determining a distance d (I) between received signal levels, the distance d (I) having different values for a plurality of message levels (see fig.4 element 270).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Bakke into Morgan as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

As per claim 10, Morgan et al method of forming a constellation design having a selected number of message levels, the constellation design forming part of a receiver that identifies a transmitted message based upon a received signal, the method comprising: determining a minimum threshold and a maximum threshold representing a range for each of a plurality of possible signal levels (see figs. 1, 6 element 120 and 280 and col.6, lines 6-15 and col.9, lines 2-20), wherein the sizes of the ranges are different for at least two of the message levels.

However Morgan et al does not teach calculating the distance d(I) between the maximum threshold for possible signal level (I) and the minimum threshold for possible signal level (i+1).

Bakke et al teaches means for determining a distance d (I) between received signal levels, the distance d (I) having different values for a plurality of message levels (see fig.4 element 270).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Bakke into Morgan as to determine a leading edge of the burst based

on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

As per claim 30-31, Morgan and Bakke in combination would teach the step of identifying whether the calculated distance d (I) > dmin, wherein <dmin represents a selected minimum value as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

As per claim 45, Bakke et al teaches determining a distance d(I) (see fig.4 element 270 and col.4, lines 35-55) between received signal levels, the distance d(I) having different values for a plurality of message levels, and identifying whether the determined distance d(I) > dmin, wherein dmin represents a selected minimum value (see col.4, lines 14-16 and col.6, lines 65-67). Furthermore implementing such teaching into Moran would have been obvious to one skilled in the art as to determine a leading edge of the burst based on an average of the time of the maximum and of the minimum as taught by Bakke (see col.4, lines 38-42).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 5, 11-12, 32-33, 38-39 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morgan et al U.S. patent No 5,746,488 in view of Lane U.S. patent No 5,380,450.

As per claims 5, 11 and 32, Morgan et al teaches all the features of the claimed invention except generating the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability P0.

Lane teaches analyzing the probability density function wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability P0 (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Morgan et al as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claims 12 and 33, Morgan et al teaches transmitting data points to the receiver and recording the received signal (see fig.1 col.4, lines 51-65). Furthermore implementing such teaching for identifying the probability density function would have been obvious to one skilled in the art as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claims 38 and 46, Morgan et al teaches all the features of the claimed invention except wherein the minimum and maximum thresholds define a range wherein a probability of correctly receiving a selected signal exceeds a selected probability P0.

Lane teaches analyzing the probability density function wherein the minimum and maximum thresholds define a range wherein the probability of correctly receiving a selected signal exceeds a selected probability P0 (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Morgan as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

As per claim 39, Morgan et al teaches all the features of the claimed invention except wherein the determining step comprises the steps of: identifying a probability density function for each possible signal level Y, and identifying the minimum and maximum thresholds as the boundaries of a range in the identified probability density function wherein the probability of correctly receiving a selected message level exceeds a selected probability P0.

Lane teaches identifying a probability density function for each possible signal level Y, and identifying the minimum and maximum thresholds as the boundaries of a range in the identified probability density function wherein the probability of correctly receiving a selected message level exceeds a selected probability P0 (see abstract and figs. 2-4).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Lane into Morgan as to determine the constellation size of a QAM signal without requiring a priori carrier lock before accomplishing such a determination as taught by Lane (see abstract).

Response to Arguments

3. Applicant's arguments filed 12/9/04 have been fully considered but they are not persuasive. In page 11, of the response applicant assets that Lane does not teach message levels having different sizes. Examiner respectfully disagrees. In fact Lane teaches number of bins having different constellations sizes (see col.3, lines 30-40). Therefore applicant's arguments are moot.

Allowable Subject Matter

4. Claims 6-8, 13-19, 25-27, 29, 34-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 40-41 and 43-44 are allowed over the prior art of record.

5. The following is a statement of reasons for the indication of allowable subject matter: a means for calculating the mean value, Lev (I), within a selected range defined by a selected set of minimum and maximum thresholds as recited in claims 6, 13, 17, 34, 40-41, 44. Calculating a variable range Lmse (I) for each possible message level,

Lmse (l) representing one-half the distance between the minimum and the maximum thresholds for each possible message level as recited in claims 25, 43.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bagg et al U.S. Patent No 6,341,358 b1 teaches an integrity tester.

Wilstermann et al U.S. Patent No 6,145,491 teaches a method for detecting combustion.

Chung et al U.S. Patent No 5,012,246 teaches a BiCMOS analog to digital converter.

Kimura et al U.S. Patent No 6,281,828 B1 teaches an analog digital converter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard
Primary Examiner
Art Unit 2631

5/6/05

EMMANUEL BAYARD
PRIMARY EXAMINER